

(12) UK Patent Application (19) GB (11) 2 146 405 A

(43) Application published 17 Apr 1985

(21) Application No 8422231

(22) Date of filing 3 Sep 1984

(30) Priority date

(31) 8324281

(32) 10 Sep 1983

(33) GB

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(51) INT CL⁴
F16L 39/00

(52) Domestic classification
F2G 24E2
U1S 1052 F2G

(56) Documents cited
GB A 2056007

GB A 2055166

(58) Field of search
F2G

(54) Rotating luer lock

(57) A connecting device for an administration set for intravenous fluids comprises a first member having a passage 11 for fluid and a longitudinal axis, a second member 3 having a passage 4 for fluid and a longitudinal axis and tapering interfitment means 6,9 constructed and arranged with respect to each said member so that a fluid-tight engagement can be formed between the members. A flange 7,8 extends from one of said members adjacent said tapering interfitment means. A collar 2 is rotatably mounted on the member not having the flange. The collar has internal threads 23 for engagement with the flange when the tapering interfitment means are in fluid-tight engagement. When the tapering interfitment means are not in engagement the collar may be releasably held on a restraining means 14,15 present on the member carrying the collar so that the collar is temporarily prevented from rotation and from sliding along the member.

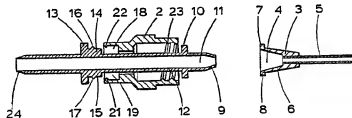


Fig. 1

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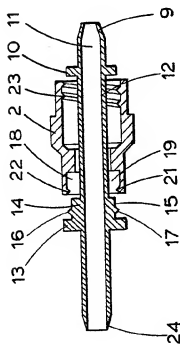
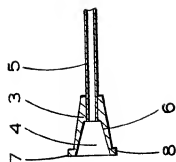


Fig. 1

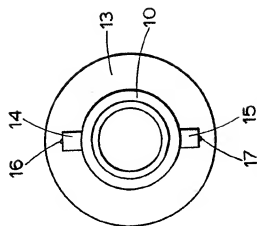


Fig. 3

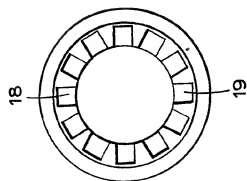


Fig. 4

SPECIFICATION

Rotating luer lock

- 5 This invention relates to a device which can be used to form a connection between an administration set for intravenous fluids and a veni puncture device such as an indwelling cannula or catheter. More particularly it relates to a connector having a rotatable collar which permits quick and effective fluid tight connection between tubing from the administration set and a catheter without inducing a twist in either of the pieces of tubing.

- A connection between an administration set and an indwelling catheter is conventionally achieved by the frictional engagement of a male fitment on the tubing from the administration set and a female fitment on the catheter, the so-called Luer Lock. While this system is reasonably secure and leak-free, this type of connection has the disadvantage that it may become disconnected during manipulation or through internal pressure. Rotatable collar members of the slidable and non-slidable or fixed type have been used with this type of connector in administration sets. Non-slidable types tend to induce twist into the tubing and/or catheter as they are rotated to secure the luer lock described above. Slidable devices are known commercially, such devices available from Vygon of Ecouen, France, Unoplast (U.K.) and Viggo of Helsingborg, Sweden. However these devices have the disadvantage that the rotating collar is free to slide along the male fitment of the luer lock between two stops which prevent the collar from sliding from the male fitment, yet there is no means present which will anchor the rotating collar during manufacture, sterilisation, or manipulation making the connection. It is a disadvantage to have the collar unrestrained as it makes manipulation during connection difficult and may impair complete sterilisation of the device prior to use.

- One device has been described in United Kingdom Patent Application No. 2056007 which overcomes some of these disadvantages. The rotatable collar of that device is restrained prior to use by means of a frangible seal to a captive means on the male fitment, however repeated restraint and release is not available from this type of device. The male fitment of the device described in the above patent application also requires the presence of a frictional engagement means between the rotatable collar and the male fitment it is mounted on. This requires precise engineering to make the frictional engagement neither too loose nor too tight.

- The present invention overcomes the disadvantages found in prior art devices by providing a Luer Lock wherein the connection can be made with the minimum amount of manipulation, without inducing twist into either the intravenous tubing or catheter and securing the Luer Lock by means of a rotatable collar which is free to slide along its mounting member without the presence of a frictional engagement means and which can be restrained during manufacture or manipulation of the connector by means of a snap-fit means present in the mounting member.

Accordingly the present invention provides a connecting device for use in an administration set for intravenous fluids comprising a first member having a passage for fluid and a longitudinal axis; a

- 70 second member having a passage for fluid and a longitudinal axis; tapering interfitment means constructed and arranged with respect to each said member for fluid-tight engagement; a flange extending from one of said members adjacent to a tapering interfitment means; a collar member rotatably and slidably mounted on the member not having the flange, said collar member having internal threads for engagement with said flange and a restraining means on the member carrying the rotatable collar whereby the collar may be releasably held on the restraining means in a manner to prevent both rotation and sliding of these collar.

- Suitably the restraining means is positioned away from the tapering interfitment means of the member so that the portion is fully exposed during the sterilisation procedure and is not covered by the rotatable collar. The restraining means may be any which will releasably restrain the rotatable collar preventing it from rotating around or sliding along the member which carries it. Aptly the restraining means may be a flange behind which a cooperating flange on the collar may be rotated thereby restraining the collar or may be a snap-fit over an annular ring on the member carrying the collar or preferably is a snap-fit over two fins present in the member carrying the collar, the fin fitting into a corresponding recess in the rotatable collar.

- Suitably the member carrying the rotatable collar will be formed by moulding a rigid polymer. Suitable polymers include polyvinyl chloride.

- Suitably the rotatable collar will be formed by moulding from a polymer such as a polyolefin and is preferably polypropylene.

- In another aspect therefore the invention comprises a connection device adapted for interconnection with a projecting flange of a catheter unit which device comprises a member having a passage for fluid and a longitudinal axis and a collar member rotatably and slidably mounted on the member, said collar member having internal threads capable of engagement with the projecting flange of a catheter unit when present and a restraining means on the member carrying the rotatable collar member whereby the collar may be releasably held on the restraining means in a manner to prevent both rotation and sliding of the collar around or along the member.

- Suitably the catheter unit will comprise a piece of polymeric tubing holding in one end a female half of a Luer Lock which carries at one end a flange. The member of the connection device is adapted for interconnection with the catheter unit by comprising at one end a male half of a Luer Lock and carrying about its axis a rotatable collar with an internal thread which may be turned around the flange so forming a water-tight seal. The other end of the member carries a restraining means for the collar when it is not in use, the means being as hereinbefore defined.

- Normally the connecting device will be sterile and

packaged in a bacteria proof pack. Sterilisation may be carried out by the usual method of irradiation, ethylene oxide and the like.

- The connecting devices of this invention will now be described by way of example by reference to the accompanying drawings in which:-

Figure 1 shows a cross-section through a connecting device of the invention.

Figure 2 shows an end view of the rotatable collar.

- Figure 3 shows an end view of the first member.

Figure 1 shows a cross-section through a connecting device of the present invention with the three components, the member (1) carrying the rotatable collar (2) and the second member (3) which forms a fluid-tight seal with the member (1). The second member (3) has a longitudinal fluid passage (4) which is in fluid communication with a catheter (5) leading to the vein of the patient. The catheter is made of polymeric material conventionally used in an intravenous catheter for example, silicone, polyurethane and polyvinyl chloride. The second member (3) has a female tapering portion (6) which will form a fluid-tight seal with a corresponding male tapering portion (9) on the first member (1).

- The second member (3) has two flanges (7, 8) which hold the thread on the rotatable collar (2). The first member (1) has at one end a male tapering portion (9) which fits into tapering portion (6) of the second member. An annular ring (10) acts as a stop to prevent rotatable collar (2) from sliding off the member (1), but does not prevent the collar being forced over it during the assembly process. The first member has a longitudinal fluid passage (11) which communicates with an administration set for intravenous fluid and with the catheter via member (2).

- The rotatable collar (2) is free to slide along and rotate about the shaft (12) of member (1). The rotatable collar (2) is kept on member (1) by a second stop (13) which additionally is adjacent to two fins (14, 15) which have a slight projection (16, 17) on their top surface. The rotatable collar (2) has a series of recesses (18, 19) around the inside at the end (20) of the collar which accept the fins (14, 15) and have projections (21, 22) which form a snap-fit over the projections (16, 17) so restraining the collar from sliding or rotating. The other end of the rotatable collar has a thread (23) on its internal surface which accepts the flanges (7, 8) and so secures the tapering portions (6, 9) together. In use the end (24) of the first member is connected to the tubing of an administration set. The collar is held on the restraining stop (13). The tapering portion (9) is pushed into the corresponding portion (6) in the end of the catheter. The rotating collar is then pushed forward and rotated so as to accept the flanges (7, 8) and so provide a fluid-tight seal.

- Figure 2 shows an end on view of the rotatable collar (2) of end (20) showing the recesses arranged around the inside of the collar. Each recess is capable of fitting over fins (16, 17), thereby facilitating placement as there is no preferred way of arranging the collar.

- Figure 3 shows an end view of the first member 1, showing the disposition of fins (14, 15) and the projections (16, 17). The fins are of a size to fit into slots (18, 19) of the collar shown in Figure 2.

- CLAIMS

1. A connecting device for use in an administration set for intravenous fluids comprising a first member having a passage for fluid and a longitudinal axis, a second member having a passage for fluid and a longitudinal axis, tapering interfitment means constructed and arranged with respect to each said member for fluid-tight engagement, a flange extending from one of said members adjacent to a tapering interfitment means, a collar member rotatably and slidably mounted on the member not having the flange, said collar having internal threads for engagement with said flange and a restraining means on the member carrying the rotatable collar whereby the collar may be releasably held on the restraining means in a manner to prevent both rotation and sliding of the collar around or along the member.

2. A connecting device as claimed in claim 1 in which the restraining means comprises two projections on two fins on the member carrying the collar which form a snap-fit into corresponding recesses in the collar.

3. A connecting device as claimed in claim 1 in which the restraining means comprises an annular ring on the member carrying the collar over which the collar will form a snap-fit.

4. A connecting device as claimed in claim 1 in which the restraining means is a flange on the member carrying the collar behind which a cooperating flange on the collar may be rotated thereby restraining the collar.

5. A connection device adopted for interconnection with a projecting flange of a catheter unit comprises a member having a passage for fluid and a longitudinal axis and a collar member rotatably and slidably mounted on the member, said collar member having internal threads capable of engagement with the projecting flange of a catheter unit when present and a retaining means on the member carrying the rotatable collar whereby the collar may be releasably held on the restraining means in a manner to prevent both rotation and sliding of the collar around or along the member.

6. A connection device as claimed in claim 5 in which the restraining means comprises two projections on two fins on the member carrying the collar which form a snap-fit into corresponding recesses in the collar.

- Printed in the UK for HMSO, D8818935, 285, 7102.
Published by The Patent Office, 25 Southampton Buildings, London, WC2A 1AY, from which copies may be obtained.